PHOENIX
Environmental Laboratories, Inc.

Friday, November 01, 2019

Attn: Ms. Jennifer Atkins
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Project ID: **GULF CHELSEA TERMINAL 60597375-0500**
SDG ID: **GCE25850**
Sample ID#s: CE25850 - CE25853

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

Enclosed are revised Analysis Report pages. Please replace and discard the original pages. If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

SDG Comments

November 01, 2019

SDG I.D.: GCE25850

Version 3: Re-digested metals , re-run and reported by method 200.8

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

November 01, 2019

SDG I.D.: GCE25850

Project ID: GULF CHELSEA TERMINAL 60597375-0500

Client Id	Lab Id	Matrix
OUTFALL 003	CE25850	SW DISCHARGE
CHELSEA CREEK	CE25851	SW DISCHARGE
TRIP BLANK 1	CE25852	WATER
TRIP BLANK 2	CE25853	WATER

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 01, 2019

FOR: Attn: Ms. Jennifer Atkins
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Sample Information		Custody Information		Date	Time
Matrix:	SW DISCHARGE	Collected by:		10/02/19	7:05
Location Code:	AECOME-GULF	Received by:	CP	10/02/19	17:17
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	112185				

Laboratory Data

SDG ID: GCE25850
Phoenix ID: CE25850

Project ID: GULF CHELSEA TERMINAL 60597375-0500
Client ID: OUTFALL 003

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Cadmium	< 0.0002	0.0002	mg/L	2	10/30/19	CPP	E200.8-5.4
Copper	0.0066	0.0025	mg/L	5	10/30/19	CPP	E200.8-5.4
Nickel	0.0028	0.0025	mg/L	5	10/30/19	CPP	E200.8-5.4
Lead	0.0068	0.0002	mg/L	2	10/30/19	CPP	E200.8-5.4
Zinc	0.016	0.004	mg/L	1	10/08/19	EK	E200.7
Chlorine Residual	< 0.02	0.02	mg/L	1	10/02/19 20:56	O	SM4500Cl-G-00
Ammonia as Nitrogen	0.32	0.05	mg/L	1	10/04/19	KDB	E350.1
Oil and Grease by EPA 1664A	< 1.4	1.4	mg/L	1	10/08/19	MSF	EPA 1664
pH	7.78	1.00	pH Units	1	10/03/19 05:47	AP/KDB	SM4500-H B-11
Salinity	< 0.5	0.5	ppt	1	10/03/19	AP	SM2520B-10
Total Organic Carbon	5.4	1.0	mg/L	1	10/07/19	EG	SM5310B-11
Total Suspended Solids	9.7	3.2	mg/L	0.6	10/04/19	NLM/BJA	SM 2540D-11
Total Solids	270	20	mg/L	2	10/03/19	BJA	SM2540B-11
Semi-Volatile Extraction	Completed				10/03/19	P/AK	SW3520C
Total Metals Digestion	Completed				10/04/19	AG	
Total Metals Digestion MS	Completed				10/29/19	AG/BF	
Aquatic Toxicity - LC50	Completed				10/28/19	*	
Aromatic Volatiles w/Napthalene							
Benzene	ND	1.0	ug/L	1	10/03/19	MH	E624.1
Methyl t-butyl ether (MTBE)	ND	2.0	ug/L	1	10/03/19	MH	E624.1
Naphthalene	ND	1.0	ug/L	1	10/03/19	MH	E624.1
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	101		%	1	10/03/19	MH	70 - 130 %
% Bromofluorobenzene	97		%	1	10/03/19	MH	70 - 130 %
% Dibromofluoromethane	107		%	1	10/03/19	MH	70 - 130 %
% Toluene-d8	98		%	1	10/03/19	MH	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ethanol	ND	400	ug/L	1	10/08/19	HM	E624.1
Semivolatiles by SIM, PAH							
Benzo(a)pyrene	ND	0.10	ug/L	1	10/04/19	WB	E625.1
Naphthalene	ND	0.49	ug/L	1	10/04/19	WB	E625.1
QA/QC Surrogates							
% 2-Fluorobiphenyl	69		%	1	10/04/19	WB	40 - 140 %
% Nitrobenzene-d5	68		%	1	10/04/19	WB	40 - 140 %
% Terphenyl-d14	52		%	1	10/04/19	WB	40 - 140 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

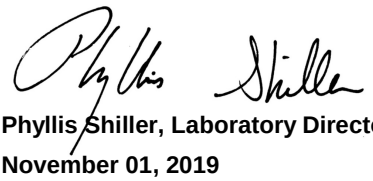
Comments:

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

* See Attached

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 01, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 01, 2019

FOR: Attn: Ms. Jennifer Atkins
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Sample Information		Custody Information		Date	Time
Matrix:	SW DISCHARGE	Collected by:		10/02/19	7:15
Location Code:	AECOME-GULF	Received by:	CP	10/02/19	17:17
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	112185				

Laboratory Data

SDG ID: GCE25850
Phoenix ID: CE25851

Project ID: GULF CHELSEA TERMINAL 60597375-0500
Client ID: CHELSEA CREEK

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Cadmium	< 0.0002	0.0002	mg/L	2	10/30/19	CPP	E200.8-5.4
Copper	0.0112	0.0025	mg/L	5	10/30/19	CPP	E200.8-5.4
Nickel	0.0179	0.0025	mg/L	5	10/30/19	CPP	E200.8-5.4
Lead	0.0024	0.0005	mg/L	5	10/30/19	CPP	E200.8-5.4
Zinc	0.020	0.020	mg/L	5	10/10/19	CPP	E200.7
Chlorine Residual	< 0.02	0.02	mg/L	1	10/02/19 20:57	O	SM4500Cl-G-00
Ammonia as Nitrogen	0.14	0.10	mg/L	2	10/05/19	KDB	E350.1
pH	7.83	1.00	pH Units	1	10/03/19 05:49	AP/KDB	SM4500-H B-11
Salinity	26.8	0.5	ppt	1	10/03/19	AP	SM2520B-10
Total Organic Carbon	2.1	1.0	mg/L	1	10/07/19	EG	SM5310B-11
Total Suspended Solids	14	3.3	mg/L	0.7	10/04/19	NLM/BJA	SM 2540D-11
Total Solids	34000	200	mg/L	20	10/03/19	BJA	SM2540B-11
Total Metals Digestion	Completed				10/04/19	AG	
Total Metals Digestion MS	Completed				10/29/19	AG/BF	
Aquatic Toxicity - LC50	Completed				10/28/19	*	

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

* See Attached

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
November 01, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 01, 2019

FOR: Attn: Ms. Jennifer Atkins
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		10/02/19	
Location Code:	AECOME-GULF	Received by:	CP	10/02/19	17:17
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	112185				

Laboratory Data

SDG ID: GCE25850
Phoenix ID: CE25852

Project ID: GULF CHELSEA TERMINAL 60597375-0500
Client ID: TRIP BLANK 1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aromatic Volatiles w/Napthalene							
Benzene	ND	1.0	ug/L	1	10/02/19	MH	E624.1
Methyl t-butyl ether (MTBE)	ND	2.0	ug/L	1	10/02/19	MH	E624.1
Naphthalene	ND	1.0	ug/L	1	10/02/19	MH	E624.1
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	101		%	1	10/02/19	MH	70 - 130 %
% Bromofluorobenzene	97		%	1	10/02/19	MH	70 - 130 %
% Dibromofluoromethane	108		%	1	10/02/19	MH	70 - 130 %
% Toluene-d8	98		%	1	10/02/19	MH	70 - 130 %
Ethanol	ND	400	ug/L	1	10/09/19	HM	E624.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

TRIP BLANK INCLUDED.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
November 01, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President

Ver 3

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 01, 2019

FOR: Attn: Ms. Jennifer Atkins
AECOM
250 Apollo Drive
Chelmsford, MA 01824

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		10/02/19	
Location Code:	AECOME-GULF	Received by:	CP	10/02/19	17:17
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	112185				

Laboratory Data

SDG ID: GCE25850
Phoenix ID: CE25853

Project ID: GULF CHELSEA TERMINAL 60597375-0500
Client ID: TRIP BLANK 2

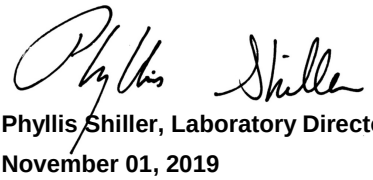
Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aromatic Volatiles w/Napthalene							
Benzene	ND	1.0	ug/L	1	10/02/19	MH	E624.1
Methyl t-butyl ether (MTBE)	ND	2.0	ug/L	1	10/02/19	MH	E624.1
Naphthalene	ND	1.0	ug/L	1	10/02/19	MH	E624.1
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	99		%	1	10/02/19	MH	70 - 130 %
% Bromofluorobenzene	100		%	1	10/02/19	MH	70 - 130 %
% Dibromofluoromethane	102		%	1	10/02/19	MH	70 - 130 %
% Toluene-d8	96		%	1	10/02/19	MH	70 - 130 %
Ethanol	ND	400	ug/L	1	10/09/19	HM	E624.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

TRIP BLANK INCLUDED.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director
November 01, 2019
Reviewed and Released by: Bobbi Aloisa, Vice President

Ver 3

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

November 01, 2019

QA/QC Data

SDG I.D.: GCE25850

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 500167 (mg/L), QC Sample No: CE25984 (CE25850, CE25851)													
ICP Metals - Aqueous													
Zinc	BRL	0.004	0.007	0.007	NC	105	103	1.9	106	107	0.9	75 - 125	20
QA/QC Batch 503874 (mg/L), QC Sample No: CE25850 5X (CE25850, CE25851)													
ICP MS Metals - Aqueous													
Cadmium	BRL	0.0010	<0.0002	<0.0002	NC	110	112	1.8	111			75 - 125	20
Copper	BRL	0.0025	0.0066	0.0062	6.30	113	113	0.0	113			75 - 125	20
Lead	BRL	0.0005	0.0068	0.0073	7.10	113	107	5.5	106			75 - 125	20
Nickel	BRL	0.0025	0.0028	<0.0025	NC	110	114	3.6	115			75 - 125	20

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

November 01, 2019

QA/QC Data

SDG I.D.: GCE25850

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 499863 (pH), QC Sample No: CE25765 (CE25850, CE25851)													
pH			8.11	8.11	0	96.6						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 500075 (mg/L), QC Sample No: CE25816 (CE25850, CE25851)													
Total Suspended Solids	BRL	2.5	150	160	6.50	91.0						85 - 115	
QA/QC Batch 499911 (mg/L), QC Sample No: CE25850 (CE25850, CE25851)													
Total Solids	BRL	10	270	250	7.70	98.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 500500 (mg/L), QC Sample No: CE26081 (CE25850)													
Oil and Grease by EPA 1664A	BRL	1.4	<1.4	<1.4	NC	98.0			90.0			85 - 115	20
Comment:													
Additional: MS acceptance range 75-125%.													
QA/QC Batch 500471 (mg/L), QC Sample No: CE26804 (CE25850, CE25851)													
Total Organic Carbon	BRL	1.0	3.2	3.3	NC	106			97.0			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 500026 (mg/L), QC Sample No: CE25616 (CE25850)													
Ammonia as Nitrogen	BRL	0.05	<0.05	<0.05	NC	102			104			90 - 110	20
QA/QC Batch 500072 (mg/L), QC Sample No: CE25851 (CE25851)													
Ammonia as Nitrogen	BRL	0.05	0.14	0.17	NC	102			100			90 - 110	20
QA/QC Batch 499803 (mg/L), QC Sample No: CE25850 (CE25850, CE25851)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	105							

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

November 01, 2019

QA/QC Data

SDG I.D.: GCE25850

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
QA/QC Batch 499950 (ug/L), QC Sample No: CE25984 (CE25850)											
Semivolatiles by SIM, PAH											
Benzo(a)pyrene	ND	0.02	64	53	18.8	33	47	35.0	40 - 140	20	m,r
Naphthalene	ND	0.50	69	57	19.0	54	58	7.1	40 - 140	20	
% 2-Fluorobiphenyl	74	%	70	70	0.0	65	69	6.0	40 - 140	20	
% Nitrobenzene-d5	69	%	71	69	2.9	61	67	9.4	40 - 140	20	
% Terphenyl-d14	76	%	76	66	14.1	50	62	21.4	40 - 140	20	r
Comment:											
Additional 8270 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 10-110%, for soils 30-130%)											
QA/QC Batch 499912 (ug/L), QC Sample No: CE25460 (CE25850, CE25852, CE25853)											
Volatiles - Water											
Benzene	ND	0.70	82	83	1.2	82	84	2.4	65 - 135	20	
Methyl t-butyl ether (MTBE)	ND	1.0	92	93	1.1	90	93	3.3	70 - 130	30	
Naphthalene	ND	1.0	100	97	3.0	78	82	5.0	70 - 130	30	
% 1,2-dichlorobenzene-d4	100	%	101	98	3.0	101	100	1.0	70 - 130	30	
% Bromofluorobenzene	96	%	104	103	1.0	105	107	1.9	70 - 130	30	
% Dibromofluoromethane	108	%	100	99	1.0	107	103	3.8	70 - 130	30	
% Toluene-d8	96	%	99	97	2.0	100	99	1.0	70 - 130	30	
Comment:											
A blank MS/MSD was analyzed with this batch.											
QA/QC Batch 500685 (ug/L), QC Sample No: CE26112 (CE25850)											
Oxygenates											
Ethanol	ND	200	84	103	20.3	109	112	2.7	70 - 130	30	
Comment:											
A blank MS/MSD was analyzed with this batch.											
QA/QC Batch 501043 (ug/L), QC Sample No: CE28064 (CE25852, CE25853)											
Oxygenates - Water											
Ethanol	ND	200	82	96	15.7	91	98	7.4	70 - 130	30	

m = This parameter is outside laboratory MS/MSD specified recovery limits.
r = This parameter is outside laboratory RPD specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
November 01, 2019

Friday, November 01, 2019

Criteria: None

State: MA

Sample Criteria Exceedances Report

GCE25850 - AECOME-GULF

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CE25850	CU-WM-MS	Copper	MA / Client Specified Criteria / GULF CHELSEA TERMIN	0.0066	0.0025	0.0005	0.0005	mg/L
CE25850	NI-WM-MS	Nickel	MA / Client Specified Criteria / GULF CHELSEA TERMIN	0.0028	0.0025	0.0002	0.0002	mg/L
CE25850	PB-WM-MS	Lead	MA / Client Specified Criteria / GULF CHELSEA TERMIN	0.0068	0.0002	0.0002	0.0002	mg/L
CE25850	ZN-WM	Zinc	MA / Client Specified Criteria / GULF CHELSEA TERMIN	0.016	0.004	0.005	0.005	mg/L
CE25851	CU-WM-MS	Copper	MA / Client Specified Criteria / GULF CHELSEA TERMIN	0.0112	0.0025	0.0005	0.0005	mg/L
CE25851	NI-WM-MS	Nickel	MA / Client Specified Criteria / GULF CHELSEA TERMIN	0.0179	0.0025	0.0002	0.0002	mg/L
CE25851	PB-WM-MS	Lead	MA / Client Specified Criteria / GULF CHELSEA TERMIN	0.0024	0.0005	0.0002	0.0002	mg/L
CE25851	ZN-WM	Zinc	MA / Client Specified Criteria / GULF CHELSEA TERMIN	0.020	0.020	0.005	0.005	mg/L

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Comments

November 01, 2019 SDG I.D.: GCE25850

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

Cooler: Yes [X] No [ ]
Coolant: IPK [X] ICE [ ] No [ ]
Temp 2.5 Pg of

CHAIN OF CUSTODY RECORD

PHOENIX *Environmental Laboratories, Inc.*

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Data Delivery/Contact Options:
[ ] Fax:
[x] Phone: 1-978-905-2112
[x] Email: jennifer.atkins@aecom.com

Customer: AECOM
Address: 250 Apollo Drive
Chelmsford, MA 01824
Jennifer Atkins

Project: Gulf Chelsea Terminal / 60597375-0500
Report to: Jennifer Atkins
Invoice to: AECOM
QUOTE # **AE012319RM**

Project P.O: 112185

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature _____ Date: _____

Matrix Code:
DW=Drinking Water GW=Ground Water SW=Surface Water WW=Waste Water
RW=Raw Water SE=Sediment SL=Sludge S=Soil SD=Solid W=Wipe OIL=Oil
B=Bulk L=Liquid

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	TRC, Salinity, pH, T.Solids, TSS	TOC	O&G	#AECOM624-QRT	#AECOM625PAH	LC50 acute (mysid shrimp and menidia)	Ammonia	Cd, Cu, Pb, Ni, Zn 200.7	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [x] HCl	GL Amber 1000ml [x] As is [x] H2SO4	PL As is [ ] 250ml [ ] 500ml [x] 1000ml	PL H2SO4 [x] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	2.5 Gallon poly as-is	5 Gallon poly as-is
25850	Outfall 003	SW	10-2-19	0705	x	x	x	x	x	x	x	x	1				3	3	1	1	1		1		
25851	Chelsea Creek	SW	10-2-19	0715	x	x				x	x	x	1						1	1	1			4	
25852	Trip Blank 1						x										2								
25853	Trip Blank 2						x										2								

Relinquished by:	Accepted by:	Date:	Time:
		10-2-19	13:15
	Krystal Hall	10/2/19	1717

Comments, Special Requirements or Regulations:
* Samples in two coolers on ice & fridge!

Turnaround:
[ ] 1 Day*
[ ] 2 Days*
[ ] 3 Days*
[x] Standard
[ ] Other
* SURCHARGE APPLIES

RI
[ ] Direct Exposure (Residential)
[ ] GW
[ ] Other

CT
[ ] RCP Cert
[ ] GW Protection
[ ] SW Protection
[ ] GA Mobility
[ ] GB Mobility
[ ] Residential DEC
[ ] I/C DEC
[ ] Other

MA
[ ] MCP Certification
[ ] GW-1
[ ] GW-2
[ ] GW-3
[ ] S-1
[ ] S-2
[ ] S-3
[ ] MWRA eSMART
[ ] Other

State where samples were collected: MA

Data Format
[ ] Excel
[ ] PDF
[ ] GIS/Key
[ ] EQuIS
[ ] Other

Data Package
[ ] Tier II Checklist
[ ] Full Data Package*
[ ] Phoenix Std Report
[ ] Other
* SURCHARGE APPLIES

New England Bioassay
A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

77 Batson Drive
Manchester, CT 06042
T: 860.643.9560
F: 860.646.7169
www.nebio.com

NEW ENGLAND BIOASSAY A DIVISION OF GZA
ACUTE AQUATIC TOXICITY TEST REPORT

Permitee: Gulf Terminal - Chelsea, MA NPDES # MA0001091
Report submitted to: Phoenix Environmental Labs
587 East Middle Tpke, Manchester CT
Sample ID: CE25850-51
Test Month/Year: October 2019
NEB Proj # 05.0045469.00

Test Type / Method: *Mysidopsis bahia* Acute Static Non-Renewal Saltwater
Test Method 2007.0; EPA 821-R-02-012
Menidia beryllina Acute Static Non-Renewal Saltwater
Test Method 2006.0; EPA 821-R-02-012

Effluent Sample Date (s): 10/2/19 Time (s): 0705
Receiving Water Sample Date: 10/2/19 Time: 0715

Test Start Date: 10/3/19

Results Summary

Your results were as follows:

Monitoring Only

Acute Test Results

Species	LC50	A-NOEC	Permit Limit	Pass / Fail
Mysidopsis bahia	>100%	100%	N/A	monitor only
Menidia beryllina	>100%	100%	N/A	monitor only

Data Qualifiers affecting this test:

Certifications & Approvals: NH ELAP (2071), NJ DEP (CT405)

TEST REPORT CERTIFICATION

Permittee name:	Gulf Terminal - Chelsea, MA	Permit number:	MA0001091
Client sample ID:	CE25850-51	Test Start Date:	10/3/19

Whole Effluent Toxicity Test Report Certification (Permittee)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: _____ (Date)

_____ Authorized Signature

_____ Print or Type Name and Title

_____ Print or Type the Permittee's Name

MA0001091 Print or Type the NPDES Permit Number

Whole Effluent Toxicity Test Report Certification (Bioassay Laboratory)

The results reported relate only to the samples submitted as received

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: 10/28/19 (Date)

Kimberly Wills
Laboratory Manager
New England Bioassay a division of GZA

GENERAL TEST CONDITIONS

Permittee name: Gulf Terminal - Chelsea, MA Permit number: MA0001091

Client sample ID: CE25850-51 Test Start Date: 10/3/19

Sample Collection Information

Effluent Sample Date(s): 10/2/19 @ 0705 Receiving Water Sample Date: 10/2/19 @ 0715

Were samples used within the first 36 hours of collection? Yes ☑ No ☐ * (see note below)

* sample collection note:

Test Conditions

Permittee's Receiving Water: Chelsea River

Mysidopsis bahia

- Dilution water: Receiving water collected at a point immediately upstream of or away from the discharge
- Control water: Laboratory artificial saltwater (salinity 25 ± 2 ppt)

Aeration: Did Dissolved Oxygen levels fall below 40% saturation? Yes ☐ No ☑

Test Aerated at <100 bubbles/minute as of: N/A

Menidia beryllina

- Dilution water: Receiving water collected at a point immediately upstream of or away from the discharge
- Control water: Laboratory artificial saltwater (salinity 25 ± 2 ppt)

Aeration: Did Dissolved Oxygen levels fall below 40% saturation? Yes ☐ No ☑

Test Aerated at <100 bubbles/minute as of: N/A

Effluent concentrations tested: 0%, 6.25%, 12.5%, 25%, 50%, 100%

Was effluent salinity adjusted? No ☐ Yes ☑ with Instant Ocean sea salts to 25 ± 2 ppt

Dechlorination procedures: Chlorine is measured using 4500 CL-G DPD Colorimetric Method

- Dechlorination was not required

TRC results and further information about aeration of samples can be found attached in "sample receipt chemistry"

Reference Toxicant Data

Mysidopsis bahia

Date: 10/1/19
Toxicant: Sodium Dodecyl Sulfate
Dilution Water: Artificial Saltwater
Organism Source: NEB
Survival 48-h LC50: 17.7 mg/L
Results within range Yes ☑ No ☐

Menidia beryllina

Date: 9/9/19
Toxicant: Sodium Dodecyl Sulfate
Dilution Water: Artificial Saltwater
Organism Source: Aquatic Indicators
Survival 48-h LC50: 8.66 mg/L
Results within range Yes ☑ No ☐

TEST RESULTS

Permittee name: Gulf Terminal - Chelsea, MA Permit number: MA0001091

Client sample ID: CE25850-51 Test Start Date: 10/3/19

Test Acceptability Criteria

Mysidopsis bahia		*Menidia beryllina*	
Lab Control Survival:	100 %	Lab Control Survival:	97.5 %
Diluent Control Survival:	97.5 %	Diluent Control Survival:	95 %
Thiosulfate Control Survival:	N/A %	Thiosulfate Control Survival:	N/A %

Presence of an asterisk (*) indicates EPA criteria was not met, see explanation in the "Results Discussion" section at the bottom of the following page.

Test Results

	Mysidopsis bahia			*Menidia beryllina*		
	Results	Permit Limit	Pass/Fail	Results	Permit Limit	Pass/Fail
48 hr LC50	>100%			>100%		
Upper Confidence Limit	±∞			±∞		
Lower Confidence Limit	100%			100%		
Method Used	Graphical			Graphical		
48 hr A-NOEC	100%			100%		

Presence of an asterisk (*) indicates qualified data, see explanation in the "Results Discussion" section at the bottom of the following page.

Concentration - Response Evaluation

Mysids: #12 No significant effects at any test concentration with a flat concentration-response curve. Test concentrations performed very similarly to dilution control.

Menidia: #12 No significant effects at any test concentration with a flat concentration-response curve. Test concentrations performed very similarly to dilution control.

The concentration - response relationship was reviewed and the following determination was made:

Mysids	Menidia	
X	X	Results are reliable and reportable
		Results are anomalous (see explanation below)
		Results are inconclusive - retest (see explanation below)

TEST RESULTS

Permittee name:	Gulf Terminal - Chelsea, MA	Permit number:	MA0001091
Client sample ID:	CE25850-51	Test Start Date:	10/3/19

Results Discussion (if applicable):

TEST METHODS

Mysidopsis bahia

Test type:	Acute Static Non-Renewal Saltwater Test
Test Reference Manual:	EPA-821-R-02-012 "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms and Marine Organisms"
Test Method:	*Mysidopsis bahia* Survival Acute Toxicity Test - EPA 2007.0
Temperature:	25 ˚C ± 1˚C (Temperatures should not deviate by more than 3˚C during the test) (required)
Light Quality:	Ambient Laboratory Illumination (recommended)
Light Intensity:	10-20 µE/m2/s, or 50-100 ft-c (recommended)
Photoperiod:	16 hours light, 8 hours dark (recommended)
Test chamber size:	250-500 mL (recommended minimum)
Test solution volume:	200 mL (recommended minimum)
Age of Test Organisms:	1-5 days; less than or equal to 24-h range in age (required)
Number of Organisms Per Test Chamber:	10 (required minimum)
Number of Replicate Test Chambers Per Treatment:	4 (required minimum)
Number of Organisms Per Test Concentration:	40 (required minimum)
Feeding Regime:	*Artemia* nauplii are made available while holding prior to the test; feed 0.1 ml of concentrated suspension of nauplii ≤ 24-h old, 3 times daily
Aeration:	None, unless DO concentration falls below 4.0 mg/L, at which point the rate should not exceed 100 bubbles/minute. (recommended)
Test Duration:	48 hours (required)
Endpoints:	Survival - 48 hour LC50 and NOAEL
Test Acceptability:	≥ 90% survival of test organisms in controls
Sampling Requirements:	Maximum holding time of 36 hours before first use
Sample volume required:	1 L Effluent, 2 L Recieving (recommended)

Menidia beryllina

Test type:	Acute Static Non-Renewal Saltwater Test
Test Reference Manual:	EPA-821-R-02-012 "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms and Marine Organisms"
Test Method:	*Menidia beryllina* Survival Acute Toxicity Test - EPA 2006.0
Temperature:	25 ˚C ± 1˚C (Temperatures should not deviate by more than 3˚C during the test) (required)
Light Quality:	Ambient Laboratory Illumination (recommended)
Light Intensity:	10-20 µE/m2/s, or 50-100 ft-c (recommended)
Photoperiod:	16 hours light, 8 hours dark (recommended)
Test chamber size:	1 L (250 mL is the recommended minimum)
Test solution volume:	700 mL (200 mL is the recommended minimum)
Age of Test Organisms:	9-14 days; less than or equal to 24-h range in age (required)
Number of Organisms Per Test Chamber:	10 (recommended)
Number of Replicate Test Chambers Per Treatment:	4 (required minimum)
Number of Organisms Per Test Concentration:	40 (required minimum)
Feeding Regime:	*Artemia* nauplii are made available while holding prior to the test
Aeration:	None, unless DO concentration falls below 4.0 mg/L, at which point the rate should not exceed 100 bubbles/minute. (recommended)
Test Duration:	48 hours (required)
Endpoints:	Survival - 48 hour LC50 and NOAEL
Test Acceptability:	≥ 90% survival of test organisms in controls (required)
Sampling Requirements:	Maximum holding time of 36 hours before first use
Sample volume required:	2 L (recommended)

DATASHEETS & STATISTICAL ANALYSIS

NEW ENGLAND BIOASSAY
ACUTE TOXICITY DATA FORM

CLIENT:	Phoenix Environmental Labs	*M.bahia* TEST ID #	19-1425a
ADDRESS:	587 East Middle Turnpike	*M.beryllina* TEST ID #	19-1425b
	Manchester, CT 06040	CHAIN OF CUSTODY #	c39-3675/76
PERMITTEE:	Gulf Terminal - Chelsea, MA	NEB PROJECT #	05.0045469.00
PERMIT NUMBER:	MA0001091	SAMPLE ID:	CE25850-51
DILUTION WATER:	Chelsea River		

INVERTEBRATES

TEST SET-UP TECHNICIAN:	PD
TEST SPECIES:	*Mysidopsis bahia*
NEB LOT #	Mb19(9-28)
AGE:	5 days
TEST SOLUTION VOLUME (mls):	200
ORGANISMS PER TEST CHAMBER:	10
ORGANISMS PER CONCENTRATION:	40

	DATE	TIME
TEST START:	10/3/19	1202
TEST END:	10/5/19	1212

VERTEBRATES

TEST SET-UP TECHNICIAN:	PD
TEST SPECIES:	*Menidia beryllina*
NEB LOT #	Ss19AI(10-1)
AGE:	11 days
TEST SOLUTION VOLUME (mls):	700
ORGANISMS PER TEST CHAMBER:	10
ORGANISMS PER CONCENTRATION:	40

	DATE	TIME
TEST START:	10/3/19	1215
TEST END:	10/5/19	1200

LABORATORY CONTROL WATER (ASW 25 ppt ± 2)

Lot Number	Salinity (ppt)	Alkalinity mg/L CaCO3
CRIO39-036	24	120

COMMENTS:

REVIEWED BY: DATE: 10/28/19

NEW ENGLAND BIOASSAY
Mysidopsis bahia TEST DATASHEET

Facility Name: Gulf Terminal - Chelsea, MA NEB Test ID: 19-1425a
NEB Project # 05.0045469.00 Test Start Date: 10/3/19

Effluent Conc. (%)	Number of Surviving Organisms (%)			Dissolved Oxygen (mg/L)			Temperature (°C)			pH (s.u.)			Salinity (ppt)		
hour	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control A	10	10	10	7.3	6.3	5.9	24.6	24.3	24.0	7.9	8.0	8.0	24	26	27
Control B	10	10	10		6.2	5.9		24.3	24.0		8.0	8.0		26	27
Control C	10	10	10		6.1	5.7		24.3	24.0		8.0	8.0		25	26
Control D	10	10	10		6.1	5.7		24.1	24.0		8.0	7.9		26	27
Diluent A	10	10	10	7.4	6.0	5.6	24.8	24.4	24.4	7.6	7.9	7.9	27	27	27
Diluent B	10	9	9		5.8	5.3		24.7	24.7		7.8	7.8		27	27
Diluent C	10	10	10		5.9	5.1		24.7	24.6		7.8	7.8		27	27
Diluent D	10	10	10		6.0	5.2		24.7	24.2		7.8	7.8		28	28
6.25 A	10	10	10	7.4	6.0	5.5	24.5	24.6	24.1	7.7	7.9	7.8	27	27	27
6.25 B	10	10	10		5.9	5.4		24.5	24.2		7.9	7.8		27	27
6.25 C	10	10	10		5.6	5.0		24.8	24.3		7.8	7.8		27	27
6.25 D	10	10	10		5.8	5.1		24.8	24.2		7.9	7.8		27	27
12.5 A	10	10	10	7.4	5.6	4.7	24.6	24.9	24.4	7.7	7.9	7.8	26	27	27
12.5 B	10	10	10		5.7	4.7		24.5	24.5		7.9	7.9		27	27
12.5 C	10	10	10		5.9	4.9		24.4	24.7		7.9	7.8		27	27
12.5 D	10	10	10		5.9	5.0		24.6	24.8		7.9	7.8		28	28
25 A	10	10	10	7.4	6.4	5.6	24.8	24.0	24.4	7.8	7.9	7.9	26	27	27
25 B	10	10	10		6.3	5.7		24.0	24.8		7.9	7.9		27	27
25 C	10	10	10		6.3	5.5		24.1	24.7		7.9	7.9		27	27
25 D	10	10	10		6.3	5.5		24.0	24.7		7.9	8.0		27	27
50 A	10	10	10	7.3	6.1	5.5	25.0	24.0	24.9	7.9	8.0	8.0	26	27	27
50 B	10	10	10		5.7	5.5		24.2	24.6		8.0	8.0		26	27
50 C	10	10	10		5.7	5.5		24.2	24.7		8.0	8.0		26	27
50 D	10	10	10		6.0	5.6		24.2	24.5		8.0	8 l 0		27	28
100 A	10	10	10	7.3	6.1	5.9	25.4	24.1	24.6	8.0	8.1	8.2	25	26	26
100 B	10	10	10		6.0	5.5		24.0	24.7		8.1	8.2		26	26
100 C	10	10	10		5.9	5.5		24.0	24.8		8.1	8.2		26	26
100 D	10	10	10		5.9	4.9		24.0	24.8		8.1	8.1		26	26
Tech Initials	PD	LS	CH	PD	LS	KW	PD	LS	KW	PD	LS	KW	PD	LS	KW

D.O. concentration fell below 4.0 mg/L _____

All test solutions were aerated at <100 bubbles/minute starting on _____

Mysidopsis 96-h Acute Survival Test — **New England Bioassay**

Analysis ID:	10-0240-0850	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 Oct-19 14:16	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	12-2097-7881	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	03 Oct-19 12:02	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Receiving Water
Ending Date:	05 Oct-19 12:12	**Species:**	Mysidopsis bahia	**Brine:**	
Test Length:	48h	**Taxon:**	Malacostraca	**Source:**	In-House Culture **Age:** 5d
Sample ID:	01-7709-8045	**Code:**	A8E4D3D	**Project:**	
Sample Date:	02 Oct-19 07:05	**Material:**	Not Applicable	**Source:**	Gulf Oil Terminal (MA0001091)
Receipt Date:	03 Oct-19 09:14	**CAS (PC):**		**Station:**	
Sample Age:	29h	**Client:**	Phoenix Environmental Labs		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	C > T	100	>100	n/a	1	4.02%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	20	10	1	6	Asymp	0.9516	Non-Significant Effect
		12.5	20	10	1	6	Asymp	0.9516	Non-Significant Effect
		25	20	10	1	6	Asymp	0.9516	Non-Significant Effect
		50	20	10	1	6	Asymp	0.9516	Non-Significant Effect
		100	20	10	1	6	Asymp	0.9516	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0055332	0.0011066	5	1	0.4457	Non-Significant Effect
Error	0.0199195	0.0011066	18			
Total	0.0254527		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	9	4.248	2.0E-04	Unequal Variances
Variances	Mod Levene Equality of Variance Test	1	4.248	0.4457	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.4634	0.884	2.5E-08	Non-Normal Distribution

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	0.00%
6.25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%
25		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%
50		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	0.00%
6.25		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-2.97%
12.5		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-2.97%
25		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-2.97%
50		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-2.97%
100		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-2.97%

Mysidopsis 96-h Acute Survival Test — **New England Bioassay**

Analysis ID:	10-0240-0850	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 Oct-19 14:16	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.9000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

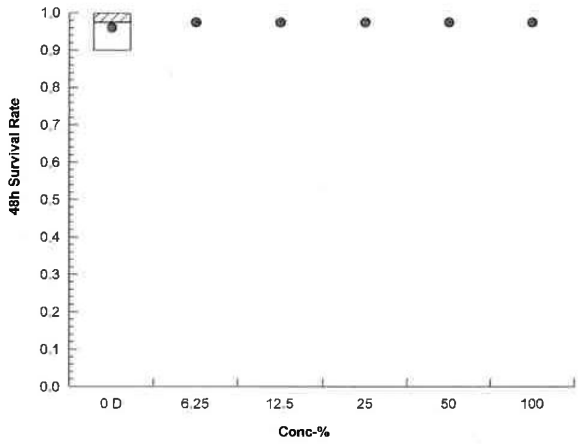
Angular (Corrected) Transformed Detail

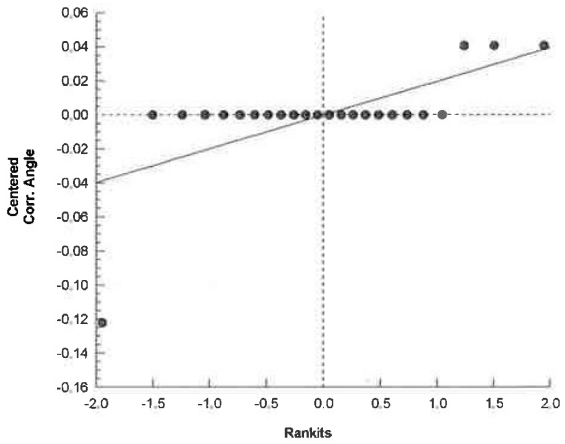
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.412	1.249	1.412	1.412
6.25		1.412	1.412	1.412	1.412
12.5		1.412	1.412	1.412	1.412
25		1.412	1.412	1.412	1.412
50		1.412	1.412	1.412	1.412
100		1.412	1.412	1.412	1.412

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	9/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

Graphics





Mysidopsis 96-h Acute Survival Test — **New England Bioassay**

Analysis ID:	01-8238-1335	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 Oct-19 14:16	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Batch ID:	12-2097-7881	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	03 Oct-19 12:02	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Receiving Water
Ending Date:	05 Oct-19 12:12	**Species:**	Mysidopsis bahia	**Brine:**	
Test Length:	48h	**Taxon:**	Malacostraca	**Source:**	In-House Culture **Age:** 5d
Sample ID:	01-7709-8045	**Code:**	A8E4D3D	**Project:**	
Sample Date:	02 Oct-19 07:05	**Material:**	Not Applicable	**Source:**	Gulf Oil Terminal (MA0001091)
Receipt Date:	03 Oct-19 09:14	**CAS (PC):**		**Station:**	
Sample Age:	29h	**Client:**	Phoenix Environmental Labs		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1748834	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

48h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	D	4	0.9750	0.9000	1.0000	0.0500	5.13%	0.0%	39/40	0.9958	0.0%
6.25		4	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%	40/40	0.9958	0.0%
12.5		4	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%	40/40	0.9958	0.0%
25		4	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%	40/40	0.9958	0.0%
50		4	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%	40/40	0.9958	0.0%
100		4	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%	40/40	0.9958	0.0%

48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.9000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000

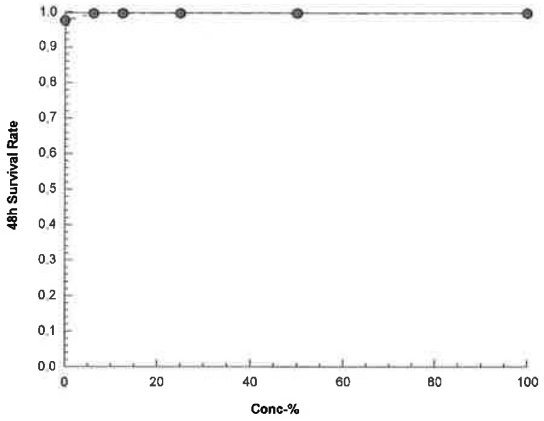
48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	9/10	10/10	10/10
6.25		10/10	10/10	10/10	10/10
12.5		10/10	10/10	10/10	10/10
25		10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10

Mysidopsis 96-h Acute Survival Test | **New England Bioassay**

Analysis ID:	01-8238-1335	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 Oct-19 14:16	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



NEW ENGLAND BIOASSAY
Menidia beryllina TEST DATASHEET

Facility Name: Gulf Terminal - Chelsea, MA NEB Test ID: 19-1425b
NEB Project # 05.0045469.00 Test Start Date: 10/3/19

Effluent Conc. (%)	Number of Surviving Organisms (%)			Dissolved Oxygen (mg/L)			Temperature (°C)			pH (s.u.)			Salinity (ppt)		
hour	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control A	10	10	10	7.3	6.5	6.8	24.6	24.5	24.6	7.9	8.1	8.1	24	25	25
Control B	10	10	10		6.5	6.9		24.9	24.8		8.1	8.1		25	25
Control C	10	10	9		6.5	6.5		24.9	24.8		8.1	8.1		25	25
Control D	10	10	10		6.4	6.5		25.0	24.6		8.1	8.1		25	25
Diluent A	10	10	10	7.4	6.7	6.7	24.8	24.3	24.8	7.6	7.9	8.0	27	27	27
Diluent B	10	9	9		6.5	6.5		24.4	25.0		7.9	8.0		27	27
Diluent C	10	10	10		6.5	6.3		24.9	24.8		7.9	8.0		27	27
Diluent D	10	10	9		6.5	6.4		25.0	24.7		7.9	8.0		27	27
6.25 A	10	10	8	7.4	6.7	6.6	24.5	24.2	24.8	7.7	7.9	8.0	27	27	27
6.25 B	10	10	10		6.6	6.5		24.8	24.9		7.9	8.0		27	27
6.25 C	10	10	10		6.5	6.6		24.8	24.8		7.9	8.0		27	27
6.25 D	10	10	10		6.4	6.5		24.8	24.6		7.9	8.0		27	27
12.5 A	10	10	10	7.4	6.6	6.6	24.6	24.3	24.8	7.7	8.0	8.0	26	27	27
12.5 B	10	10	9		6.5	6.6		24.7	25.1		7.9	8.1		27	27
12.5 C	10	10	10		6.6	6.4		24.8	25.0		7.9	8.1		27	27
12.5 D	10	10	10		6.5	6.5		24.8	24.9		7.9	8.1		27	27
25 A	10	10	10	7.4	6.7	6.5	24.8	24.1	25.0	7.8	8.0	8.1	26	27	27
25 B	10	10	10		6.5	6.4		24.3	25.3		8.0	8.1		27	26
25 C	10	10	9		6.6	6.4		24.4	25.2		8.0	8.0		27	26
25 D	10	10	10		6.5	6.1		24.4	24.9		8.0	8.1		27	27
50 A	10	10	9	7.3	6.7	6.5	25.0	24.2	24.9	7.9	8.1	8.2	26	26	27
50 B	10	10	10		6.6	6.5		24.5	25.0		8.1	8.2		26	26
50 C	10	10	9		6.6	6.4		24.7	24.9		8.1	8.2		26	26
50 D	10	10	10		6.4	6.4		24.6	25.0		8.1	8.3		26	26
100 A	10	10	10	7.3	6.5	6.6	25.4	24.1	24.8	8.0	8.2	8.3	25	26	26
100 B	10	10	10		6.4	6.5		24.2	24.7		8.2	8.3		25	26
100 C	10	10	10		6.4	6.5		24.6	24.7		8.2	8.3		25	26
100 D	10	10	10		6.3	6.4		24.6	24.8		8.2	8.3		25	26
Tech Initials	PD	LS	CH	PD	LS	KW	PD	LS	KW	PD	LS	KW	PD	LS	KW

D.O. concentration fell below 4.0 mg/L _____
All test solutions were aerated at <100 bubbles/minute starting on _____

Inland Silverside 96-h Acute Survival Test — **New England Bioassay**

Analysis ID:	07-1250-9614	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 Oct-19 14:19	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1
Batch ID:	10-2453-3233	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	03 Oct-19 12:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Receiving Water
Ending Date:	05 Oct-19 12:00	**Species:**	Menidia beryllina	**Brine:**	
Test Length:	48h	**Taxon:**	Actinopterygii	**Source:**	In-House Culture **Age:** 11d
Sample ID:	09-3992-7634	**Code:**	38062852	**Project:**	
Sample Date:	02 Oct-19 07:05	**Material:**	Not Applicable	**Source:**	Gulf Oil Terminal (MA0001091)
Receipt Date:	03 Oct-19 09:14	**CAS (PC):**		**Station:**	
Sample Age:	29h	**Client:**	Phoenix Environmental Labs		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	C > T	100	>100	n/a	1	10.86%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	19	10	2	6	Asymp	0.9055	Non-Significant Effect
		12.5	20	10	3	6	Asymp	0.9516	Non-Significant Effect
		25	20	10	3	6	Asymp	0.9516	Non-Significant Effect
		50	18	10	3	6	Asymp	0.8333	Non-Significant Effect
		100	22	10	2	6	Asymp	0.9908	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0210805	0.0042161	5	0.4665	0.7961	Non-Significant Effect
Error	0.162666	0.009037	18			
Total	0.183746		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	3.794	4.248	0.0160	Equal Variances
Variances	Mod Levene Equality of Variance Test	0.6928	4.248	0.6355	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.851	0.884	0.0023	Non-Normal Distribution

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.9500	0.8581	1.0000	0.9500	0.9000	1.0000	0.0289	6.08%	0.00%
6.25		4	0.9500	0.7909	1.0000	1.0000	0.8000	1.0000	0.0500	10.53%	0.00%
12.5		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	-2.63%
25		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	-2.63%
50		4	0.9500	0.8581	1.0000	0.9500	0.9000	1.0000	0.0289	6.08%	0.00%
100		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.331	1.181	1.48	1.331	1.249	1.412	0.04705	7.07%	0.00%
6.25		4	1.336	1.093	1.578	1.412	1.107	1.412	0.07622	11.41%	-0.40%
12.5		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	-3.06%
25		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	-3.06%
50		4	1.331	1.181	1.48	1.331	1.249	1.412	0.04705	7.07%	0.00%
100		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-6.12%

Inland Silverside 96-h Acute Survival Test — **New England Bioassay**

Analysis ID:	07-1250-9614	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 Oct-19 14:19	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.9000	1.0000	0.9000
6.25		0.8000	1.0000	1.0000	1.0000
12.5		1.0000	0.9000	1.0000	1.0000
25		1.0000	1.0000	0.9000	1.0000
50		0.9000	1.0000	0.9000	1.0000
100		1.0000	1.0000	1.0000	1.0000

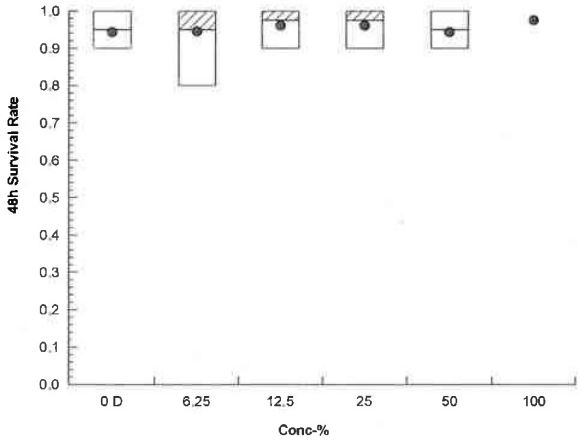
Angular (Corrected) Transformed Detail

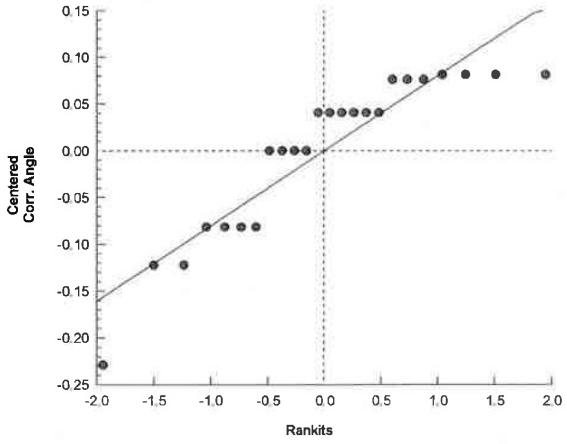
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.412	1.249	1.412	1.249
6.25		1.107	1.412	1.412	1.412
12.5		1.412	1.249	1.412	1.412
25		1.412	1.412	1.249	1.412
50		1.249	1.412	1.249	1.412
100		1.412	1.412	1.412	1.412

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	9/10	10/10	9/10
6.25		8/10	10/10	10/10	10/10
12.5		10/10	9/10	10/10	10/10
25		10/10	10/10	9/10	10/10
50		9/10	10/10	9/10	10/10
100		10/10	10/10	10/10	10/10

Graphics





Inland Silverside 96-h Acute Survival Test — **New England Bioassay**

Analysis ID:	06-0094-1727	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 Oct-19 14:19	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Batch ID:	10-2453-3233	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	03 Oct-19 12:15	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Receiving Water
Ending Date:	05 Oct-19 12:00	**Species:**	Menidia beryllina	**Brine:**	
Test Length:	48h	**Taxon:**	Actinopterygii	**Source:**	In-House Culture **Age:** 11d
Sample ID:	09-3992-7634	**Code:**	38062852	**Project:**	
Sample Date:	02 Oct-19 07:05	**Material:**	Not Applicable	**Source:**	Gulf Oil Terminal (MA0001091)
Receipt Date:	03 Oct-19 09:14	**CAS (PC):**		**Station:**	
Sample Age:	29h	**Client:**	Phoenix Environmental Labs		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	585354	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

48h Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	D	4	0.9500	0.9000	1.0000	0.0577	6.08%	0.0%	38/40	0.9667	0.0%
6.25		4	0.9500	0.8000	1.0000	0.1000	10.53%	0.0%	38/40	0.9667	0.0%
12.5		4	0.9750	0.9000	1.0000	0.0500	5.13%	-2.63%	39/40	0.9667	0.0%
25		4	0.9750	0.9000	1.0000	0.0500	5.13%	-2.63%	39/40	0.9667	0.0%
50		4	0.9500	0.9000	1.0000	0.0577	6.08%	0.0%	38/40	0.9667	0.0%
100		4	1.0000	1.0000	1.0000	0.0000	0.00%	-5.26%	40/40	0.9667	0.0%

48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.9000	1.0000	0.9000
6.25		0.8000	1.0000	1.0000	1.0000
12.5		1.0000	0.9000	1.0000	1.0000
25		1.0000	1.0000	0.9000	1.0000
50		0.9000	1.0000	0.9000	1.0000
100		1.0000	1.0000	1.0000	1.0000

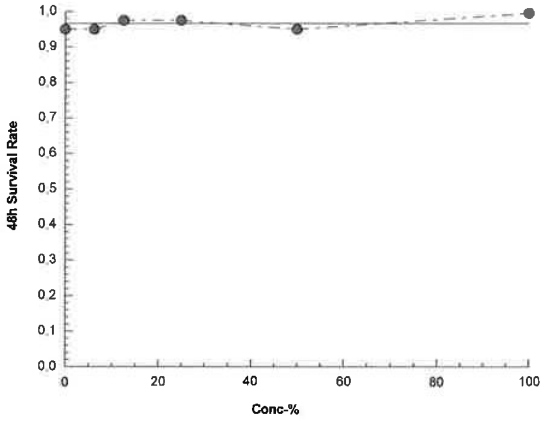
48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	9/10	10/10	9/10
6.25		8/10	10/10	10/10	10/10
12.5		10/10	9/10	10/10	10/10
25		10/10	10/10	9/10	10/10
50		9/10	10/10	9/10	10/10
100		10/10	10/10	10/10	10/10

Inland Silverside 96-h Acute Survival Test **New England Bioassay**

Analysis ID:	06-0094-1727	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	22 Oct-19 14:19	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



NEB SALTWATER SPE ES ACCLIMATION RECORD

Species: *Menidia beryllina*	Client: Golf Oil Test ID:	Quantity:	*Mortality upon arrival
Source: Aquatic Indicators	Lot #: S519AI(10-1)	Age: 10 days on 10-2-19	* Mortality > 10% - Notify management

Allowable Mortality: > 5% mortality = Notify management.

Allowable Acclimation: Fish = No more than 50% tank volume water change over a 12 (twelve) hour period.

Mysids = Need to be +/- 2 ppt of test dilution water.

Water Chemistry						Observations						
Date	D.O. (mg/L)	p.H. (SU)	Temp. (C) *	Alkal. (mg/L) ml titrant	Sal. (ppt) **	Feedings			Behavioral observations	Do organisms look stressed?	Mortalities	Comments / Treatment type
						AM	NOON	PM	A = Normal, B = Erratic mov. C = Dead	Yes / No	# of dead organisms removed from tank	
10-2-19	7.0	—	23.3	— / — ml	27	SJP	KF	SJP	A	No	2	Acclimated to ASW
10-3-19	6.9		23.4		27	SJP	SJP		A	No	0	10L ASW H2O D

SAMPLE RECEIPT CHEMISTRY
&
CHAIN OF CUSTODY DOCUMENTS

NEW ENGLAND BIOASSAY
INITIAL CHEMISTRY DATA

PERMITTEE: Gulf Terminal - Chelsea, MA
NEB PROJECT # 05.0045469.00

DATE RECEIVED	10/3/19	
SAMPLE TYPE:	Effluent	Receiving Water
COC #	C39- 3675	C39- 3676
pH (SU)	7.4	7.6
Temperature (°C)	7.3	6.5, 6.6, 6.9, 7.0
Dissolved Oxygen (mg/L)	6.9	6.7
Conductivity (µmhos)	472	42,100
Salinity (ppt)	<1	27
TRC - DPD (mg/L)	0.026	0.010
TRC - Amperometric (mg/L)	N/A	N/A
Hardness (mg/L as CaCO3)	78	4900
Alkalinity (mg/l as CaCO3)	220	110
Tech Initials	BA	BA

NOTE: NA = NOT APPLICABLE

Salinity Adjustments							
Sample ID	**Volume**	**Init. Salinity (ppt)**	**Added: g of Instant Ocean or L of DI Water**	**Final Salinity (ppt)**	**Instant Ocean Lot # (if applicable)**	**Date**	**Tech**
Effluent	10L	<1	300g	25	IO19 (9-4)	10/3/19	PD
Receiving	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Received
ON ICE

Cooler: Yes ☐ No ☐
Coolant: IPK ☐ ICE ☐ No ☐
Temp °C Pg of

PHOENIX
Environmental Laboratories, Inc.
TO

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Data Delivery/Contact Options:
☐ Fax:
☐ Phone:
☐ Email:

~~Customer:~~ G2A-NEB
Address:

Project:
Report to: Bobbi Alaisa
Invoice to:
QUOTE #

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature _____ Date: _____

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = _____(Other)

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Analysis Request: Aquatic-LC50	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz.	GL Soil container ( ) oz.	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
CE25850	C39-3675	SW	10-2-19	07:05	X												
CE25851	C39-3676	SW	10-2-19	07:15	X												

Relinquished by:	Accepted by:	Date:	Time:
John Bailey		10-3-19	0914

Comments, Special Requirements or Regulations:
AECom - Gulf Chelsea Terminal.

Turnaround Time:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☑ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ (Residential) Direct Exposure
☐ (Comm/Industrial) Direct Exposure
☐ GA Leachability
☐ GB Leachability
☐ GA-GW Objectives
☐ GB-GW Objectives

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1 ☐ MWRA eSMART
☐ GW-2
☐ GW-3
☐ S-1 GW-1 ☐ S-1 GW-2 ☐ S-1 GW-3
☐ S-2 GW-1 ☐ S-2 GW-2 ☐ S-2 GW-3
☐ S-3 GW-1 ☐ S-3 GW-2 ☐ S-3 GW-3
☐ SW Protection

State where samples were collected: MA

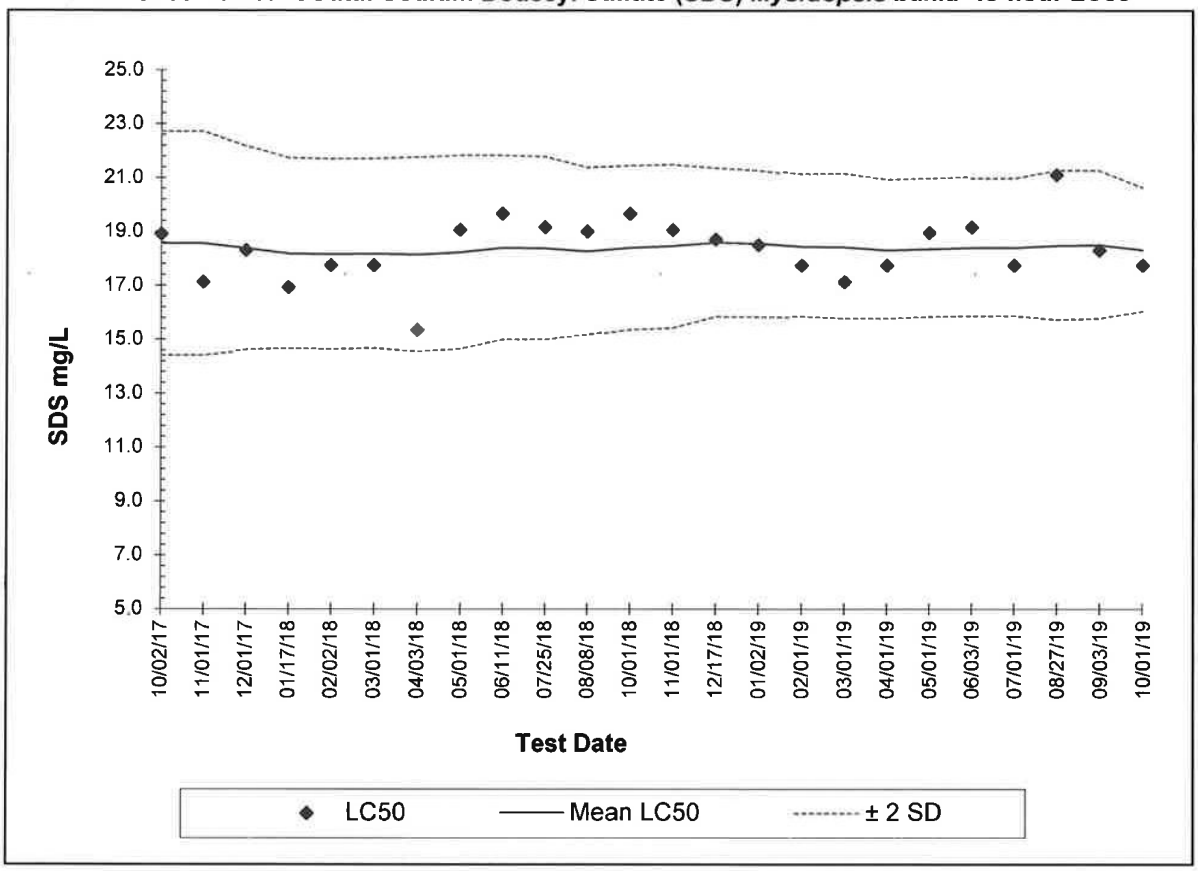
Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other
* SURCHARGE APPLIES

REFERENCE TOXICANT CHARTS

New England Bioassay

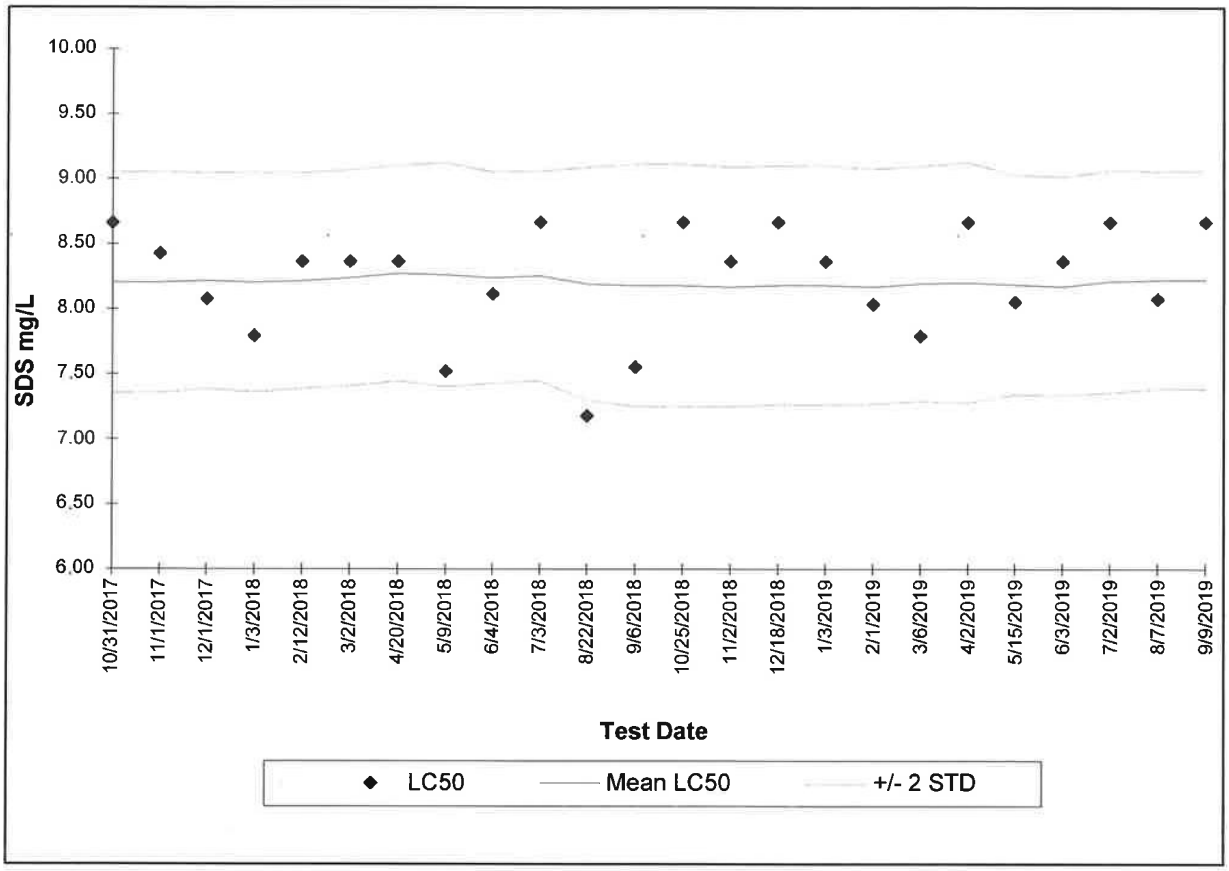
Reference Toxicant Data: Sodium Dodecyl Sulfate (SDS) *Mysidopsis bahia* 48-hour LC50



Test ID	Date	LC_{50}	Mean LC_{50}	STD	-2STD	+2STD	CV	CV National 75th & 90th%
17-1520	10/2/2017	18.9	18.6	2.1	14.4	22.7	0.11	0.26
17-1693	11/1/2017	17.1	18.6	2.1	14.4	22.7	0.11	0.26
17-1804	12/1/2017	18.3	18.4	1.9	14.6	22.2	0.10	0.26
18-92	1/17/2018	16.9	18.2	1.8	14.6	21.7	0.10	0.26
18-188	2/2/2018	17.7	18.1	1.8	14.6	21.7	0.10	0.26
18-294	3/1/2018	17.7	18.2	1.8	14.6	21.7	0.10	0.26
18-469	4/3/2018	15.3	18.1	1.8	14.5	21.8	0.10	0.26
18-612	5/1/2018	19.0	18.2	1.8	14.6	21.8	0.10	0.26
18-815	6/11/2018	19.6	18.4	1.7	15.0	21.8	0.09	0.26
18-1086	7/25/2018	19.1	18.4	1.7	15.0	21.8	0.09	0.26
18-1156	8/8/2018	19.0	18.3	1.6	15.2	21.4	0.09	0.26
18-1470	10/1/2018	19.6	18.4	1.5	15.4	21.4	0.08	0.26
18-1627	11/1/2018	19.0	18.5	1.5	15.4	21.5	0.08	0.26
18-1828	12/17/2018	18.7	18.6	1.4	15.8	21.3	0.07	0.26
19-7	1/2/2019	18.5	18.5	1.4	15.8	21.3	0.07	0.26
19-153	2/1/2019	17.7	18.4	1.3	15.8	21.1	0.07	0.26
19-262	3/1/2019	17.1	18.4	1.3	15.7	21.1	0.07	0.26
19-402	4/1/2019	17.7	18.3	1.3	15.7	20.9	0.07	0.26
19-552	5/1/2019	18.9	18.4	1.3	15.8	20.9	0.07	0.26
19-693	6/3/2019	19.1	18.4	1.3	15.8	21.0	0.07	0.26
19-870	7/1/2019	17.7	18.4	1.3	15.8	21.0	0.07	0.26
19-1202	8/27/2019	21.1	18.5	1.4	15.7	21.3	0.08	0.26
19-1231	9/3/2019	18.3	18.5	1.4	15.7	21.3	0.07	0.26
19-1407	10/1/2019	17.7	18.3	1.2	16.0	20.6	0.06	0.26

New England Bioassay

Reference Toxicant Data: Sodium Dodecyl Sulfate (SDS) *Menidia beryllina* 48-hour LC50



Test ID	Date	LC_{50}	Mean LC_{50}	STD	-2STD	+2STD	CV	CV National 75th%	CV National 90th%
17-1685	10/31/2017	8.66	8.20	0.42	7.35	9.05	0.05	0.21	0.44
17-1694	11/1/2017	8.42	8.20	0.42	7.36	9.05	0.05	0.21	0.44
17-1805	12/1/2017	8.07	8.22	0.42	7.38	9.05	0.05	0.21	0.44
18-17	1/3/2018	7.79	8.20	0.42	7.36	9.05	0.05	0.21	0.44
18-222	2/12/2018	8.36	8.22	0.42	7.39	9.05	0.05	0.21	0.44
18-295	3/2/2018	8.36	8.24	0.42	7.41	9.07	0.05	0.21	0.44
18-552	4/20/2018	8.36	8.27	0.42	7.44	9.10	0.05	0.21	0.44
18-655	5/9/2018	7.52	8.26	0.43	7.40	9.12	0.05	0.21	0.44
18-754	6/4/2018	8.11	8.24	0.41	7.43	9.05	0.05	0.21	0.44
18-916	7/3/2018	8.66	8.25	0.40	7.45	9.06	0.05	0.21	0.44
18-1182	8/22/2018	7.18	8.19	0.45	7.30	9.09	0.05	0.21	0.44
18-1307	9/6/2018	7.55	8.18	0.47	7.25	9.11	0.06	0.21	0.44
18-1615	10/25/2018	8.66	8.18	0.47	7.25	9.11	0.06	0.21	0.44
18-1619	11/2/2018	8.36	8.17	0.46	7.25	9.09	0.06	0.21	0.44
18-1856	12/18/2018	8.66	8.18	0.46	7.26	9.10	0.06	0.21	0.44
19-13	1/3/2019	8.36	8.18	0.46	7.26	9.10	0.06	0.21	0.44
19-154	2/1/2019	8.03	8.17	0.45	7.27	9.08	0.06	0.21	0.44
19-287	3/6/2019	7.79	8.20	0.45	7.29	9.10	0.06	0.21	0.44
19-408	4/2/2019	8.66	8.20	0.46	7.28	9.13	0.06	0.21	0.44
19-618	5/15/2019	8.05	8.19	0.42	7.34	9.03	0.05	0.21	0.44
19-694	6/3/2019	8.36	8.18	0.42	7.33	9.02	0.05	0.21	0.44
19-873	7/2/2019	8.66	8.21	0.43	7.36	9.07	0.05	0.21	0.44
19-1095	8/7/2019	8.07	8.22	0.42	7.39	9.06	0.05	0.21	0.44
19-1280	9/9/2019	8.66	8.22	0.42	7.38	9.06	0.05	0.21	0.44